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| 10/555,713 | 10/20/2006 | Martin Hausner | BEET-14 | 9725 |

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| EXAMINER | |
|---|---|
| PHAM, THANH V | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/555,713 | HAUSNER ET AL. | |
| | Examiner | Art Unit | |
| | THANH V. PHAM | 2894 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10 May 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *18-32* is/are pending in the application.

4a) Of the above claim(s) *30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-29 and 31-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 May 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 18- are rejected under 35 U.S.C. 103(a) as being unpatentable over Wienand et al. US 6,712,987 B2 in combination with Schiller WO 01/000523 A1 (provided by applicant), Tomonari et al. EP 0 599 364 A2 (provided by applicant) and US Pub. 2003/0118076 A1 (herein after '076) and/or US 6,294,787 B1 (herein after '787), both, to Schieferdecker et al.

Re claim **18**-27, the Wienand et al. reference discloses a radiation sensor comprising:

a support 1;

a cavity 6 which may be a recess or a through hole formed in one surface of the support 1;

a dielectric membrane 3 provided on the one surface of the support 1;

a sensor element 4 formed above the cavity 6;

electric terminals 7, 8 for the sensor element 4, characterised in that:

the side wall of the cavity 6 is essentially orthogonal to the support surface;

the cavity 6 is formed; and

an etching stop layer 2 is formed on the one surface of the support 1 between the one surface of the support 1 and the dielectric membrane 3.

The Wienand et al. reference does not discloses the cavity in the surface of the support has a round or oval contour, and the cavity 6 is formed through dry etching.

The Schiller reference discloses on page 14 that "the shape of the void 170 is such that no proof mass is retained", "the conductive layers 252a and 252b are preferably configured to efficiently excite the fundamental vibration mode of the diaphragm layer 240 suspended over the void 270".

The Tomonari et al. reference discloses in fig. 59 rounded corner or circular cavity; (fig. 63 with an unnamed element on top of element 18R could be considered as lens or mirror).

The Schieferdecker et al. references disclose different shapes of the cavity in forming sensor.

To employ different shapes for the void /cavity in the structure of sensor would have been obvious to one of ordinary skill in the sensor formation art as the different shape would be selected in accordance with the sensor as taught by Schiller and Tomonari et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the sensor structure with different shapes as taught by Schieferdecker et al. The use of different shapes for the cavity is well known to those skilled in the art as taught by Schieferdecker et al.

The claim recites "the cavity 6 is formed through dry etching", while not objectionable, the Office reminds applicant that "product-by-process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re* Hirao, 190 USPQ 15 at 17 (footnote 3). See also, *In re* Brown, 173 USPQ 685; *In re* Luck, 177 USPQ 523; *In re* Fessmann, 180 USPQ 324; *In* re Avery, 186 USPQ 161; *In re* Wethheim, 191 USPQ 90; *In re* Marosi et al., 218 USPQ 289;

and particularly *In re* Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. Note that applicant has the burden of proof in such cases, as the above case law makes clear. Thus, no patentable weight will be given to those process steps which do not add structural limitations to the final product.

Re claim 19, in the combination, at least the Wienand et al. reference discloses a radiation sensor according to claim **18**, the support 1 has a rectangular contour.

Re claim 20, in the combination, a radiation sensor according to claim 19, characterized in that one or more electric terminals are provided in a corner section of the sensor (at least in Schieferdecker et al. '076, fig. 7/55,57, e.g.).

Re claim 21, in the combination, a radiation sensor according to claim **18**, characterized in that the sensor element is a thermopile (Schieferdecker et al. '076, [0052], e.g.).

Re claim 22, in the combination, a radiation sensor according to claim **18**, characterized in that a plurality of sensor elements are formed above one cavity (Schieferdecker et al. '076, fig. 8 or '787, figs. 2-3 and 5, e.g.).

Re claim 23, in the combination, a radiation sensor according to claim **18**, characterized by one or more of the following features:

the membrane material comprises ~~a dielectric, particularly~~ silica and/or silicon nitride (Schieferdecker et al. '787, figs. 2-3/51; '076, fig. 9/111, e.g.);

~~under the membrane an~~ the etching stop layer contains an oxide, particularly silica~~, is provided~~ (Wienand et al.'s etching stop 2). and

the support material contains silicon and/or GaAs and/or a semiconductor material (Schieferdecker et al. '076, [0060], e.g.).

Re claim 24, in the combination, a radiation sensor according to claim **18**, disclose following dimensions:

support height H: more than 50 µm, preferably more than 200 µm, less than 1,500 µm, preferably less than 600 µm (Schieferdecker et al. '076, [0024]; '787, col. 5, line 38, e.g.);

support edge length L: less than 2 mm, preferably less than 1.5 mm (Schieferdecker et al. '076, [0008]; '787, col. 6, lines 10-13, e.g.);

cavity diameter D: more than 55%, preferably more than 65% and/or less than 90%, preferably less than 80% of the support edge length (Schieferdecker et al. '076, [0025], e.g.); and

membrane thickness D: less than 3 µm, preferably more than 0.1 µm (could be made in accordance with the provided dimensions).

Re claim 25, in the combination, a wafer comprising a plurality of blanks for radiation sensors according to claim **18** formed on it, characterized in that the plurality of blanks are arranged on the support in a rectangular, rhombic, triangular or hexagonal grid (Wienand et al.'s recess 6, Schieferdecker et al. '787, col. 4, lines 15-28, e.g.).

Re claim 26, in the combination, a sensor array comprising a plurality of radiation sensors according to claim **18** (Schieferdecker et al. '787, col. 4, lines 15-28, e.g.).

Re claim 27, in the combination, a sensor array according to claim 26, characterized in that a plurality of radiation sensors are arranged in two or more rows and in two or more columns (Schieferdecker et al. '787, col. 4, lines 15-28, e.g.).

3. Claims 28-29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above combination as applied to claims 18-27 above, and further in view of applicant's admitted prior art and Fujikawa et al. US 6,548,813 B1

In the combination, the combination discloses a sensor module comprising a radiation sensor;

The combination does not clearly disclose:

a housing in which the radiation sensor is accommodated;

an optical window in the housing;

electric terminals protruding from the housing, said electric terminals being connected to the terminals; and

an optical projection element, particularly a lens or a mirror

(In addition to instant specification's page 9 applicant's admitted prior art discloses that "standard housing" has a radiation window), the Fujikawa et al. reference discloses this window and the conductor as electric terminals protruding from the housing and an optical projection element, particularly a lens or a mirror.

Because it is known as standard, one of ordinary skill in the art at the time of the invention to provide the structure of the combination with known art housing with window and electric terminals protrudes from the housing.

### *Response to Arguments*

4. Applicant's arguments with respect to claims' newly added limitation(s) have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THANH V. PHAM whose telephone number is (571)272-1866. The examiner can normally be reached on M-T (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly D. Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/THANH V. PHAM/
Primary Examiner, Art Unit 2894